

CQ-TV

THE JOURNAL OF THE BRITISH AMATEUR TELEVISION CLUB

No. 104

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The British Amateur Television Club.



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Orders for books and magazines
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COVER PHOTO

An underwater camera by OH3QJ

equipment and components to Club Sales.
Please address your letters to the most
suitable Club Official, and only write
to the Secretary if you REALLY do not
know who you want; forwarding letters
is a boring chore! Also, please enclose
a stamped addressed envelope with your
letters, with an extra stamp if you
expect it to have to be forwarded.

THE BRITISH AMATEUR TELEVISION CLUB

SUBSCRIPTIONS.

Once again it is necessary to remind members that all subscriptions are due on the 1st of January 1978. Please try to remember to pay on time as the expense of reminders only increases the cost of running B.A.T.C. Just send your cheque or GIRO order (a/c 25 612 4000) to the Treasurer whose address is on page 1.

Many members have asked for Banker's Order Forms, so we print one below. Just fill it in, cut it out and send it to the Treasurer, or send it direct to your bank and inform the Treasurer that you intend paying this way in future.



THE BRITISH AMATEUR TELEVISION CLUB

BANKER'S ORDER FORM

To the Manager

Date _____

Member's Bank _____

Please pay on my behalf IMMEDIATELY AND SUBSEQUENTLY on the first day of January each year, commencing 1st January 197____ the sum of TWO POUNDS to the account of:

The British Amateur Television Club a/c 0101260
Lloyds Bank Ltd., (sorting code No. 30-91-23)
Bigby Street, BRIGG, Lincolnshire.

Name _____

Address _____

Signature _____

Delete the words in heavy type if the current year's subscription has already been paid.

1978 BATC CONVENTION.

The Convention this year was held at the Conway Hall, Red Lion Square, London, and was attended by nearly 200 members. It was a very successful affair, and much enjoyed by those who participated; and thanks must go to Lewis Elmer, the Committee Member who organised it.

Many others were involved of course. Mike Crampton helped, the pressganged wives who served tea and buns, the exhibitors who came along with their equipment. Among these latter were the RSGB and the IBA, as well as Grant Dixon showing SSTV gear, Cyril Chivers with some FSS caption scanning equipment, Eric Putt with his pattern generator and Jeffrey Borin with the converted EVR machine described in C Q - T V 103.

Other highlights were a fascinating lecture by Ian Lever on digital television, and a discussion session on repeaters. Shown at intervals was a recording sent by John Ingham from Australia. This was of exceedingly good quality - John phoned our Chairman Don Reid on the morning of the Convention to send his good wishes - and to hope that British amateurs might compile a tape to send back in return. It will be difficult to match the quality!

During the Convention a group of members organised "live" coverage of the events and recorded on VTR the lectures and AGM. This was done with a most impressive array of equipment, and with what seemed like a vast army of helpers. Brian Summers provided an I.O. camera and monitors, Dave Wilson the vidicon cameras, Jeffrey Borin the vision mixer and SPG, Mike Cox the VTR and Trevor Brown the caption equipment. I don't know who provided the microphone! In fact, my apologies if I have omitted to credit someone in the above list - but there were so many people!

The AGM was held in the main hall from 3 o'clock to 4, and the following is a brief resume of the main facts. The minutes in full will be available from the Hon. Secretary if anyone wants the whole story.

Alan Pratt, as Treasurer presented the accounts for 1977/78 (printed on another page of this issue) and showed that the Club was financially in a very good state. Whilst the Chairman and the meeting thanked Alan for his efforts, it was decided to give the Committee power to increase the subscription by £1 in 1980 if this proves necessary. It was thought inflation might make this useful.

A telegram was read out by the Chairman, from the Dunstable Downs Group who were unable to attend due to contest activity. They offered their services as B.A.T.C. Contest Organisers in the future if this would help the Club. Since the present Contest Organiser was going to leave the Committee after the AGM, this offer was treated as a Godsend.

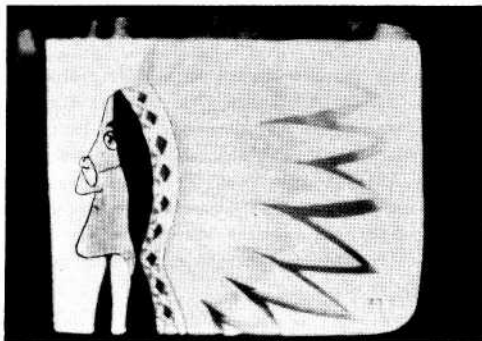
Elections were held for the new Committee and Trevor Brown, Jeffrey Borin, Graham Shirville (representing Dunstable) and Paul Marshall were voted on. Those leaving were Gordon Sharpley, Arthur Critchley and Peter Johnson who all had personal reasons for standing down. Chairman Don Reid and Treasurer Alan Pratt both agreed to remain on the Committee but emphasised that this was to be their last session, and they would expect to be replaced at the next AGM. The Club owes these two a great debt, and we are very lucky to have such hard working men at the top. The three retiring Committee Members also deserve our thanks, Gordon as a past Chairman, Arthur for his wonderful articles (we hope we may still see some) and Peter for organising contests so well.

TV on the AIR



Due to the summer holiday there are no reports worth printing this time, but here are the photos of G5KS colour pictures we "forgot" to print in the last issue. Sorry!

They show pictures as received by G4DYP over a path length of 22 Km.



Don't forget to send your letters and photos to "TV on the AIR"

54 Elkington Road, Yelvertoft,
Northampton, NN6 7LU.

COMPUTOR PICTURES ?

by Grant Dixon G8CGK

Those members who are interested in SSTV and digital circuitry might like to know of an accessory board for the micro-computer S100 bus which is popular in the U.S.A. This board is made by Vector Graphic and marketed by Jade Computer Products of California who have recently advertised in Britain. Quoting from their catalogue "The high resolution Graphic Display Board offers several, switch selectable, video outputs. In the high resolution mode, 256H x 256V screen elements are displayed while the grey-scale mode provides 120H x 120V screen elements with 16 levels of programmable grey scale. The board is designed to utilise a standard "Victor Graphic" 8K static RAM board as the refresh memory and will interface to most raster scan monitors". The price is 195 dollars as a kit and 235 dollars assembled. The price of an 8K board as mentioned ranges from about 150 dollars to 200 dollars depending on the manufacturers and the access time of the RAMs used.

Remember that this is an accessory to a microprocessor system. It is of little value on its own. Note also that the 8K refers to 8 x 1024 BYTES and 1 byte is a word of 8 bits. This gives a total of 8 x 8 x 1024 bits which is the same size of memory as is used in the WB9LVI scan converter - 64K bits.

WARNING - The board may be geared to the American scanning standards of 525 lines & 60 Hz.



A Video Modulator

by Trevor Brown G8CJS ex G6AGM/T

for use with transistorised 70 cm Transvertors.

This modulator when used in conjunction with a linear transverter can turn it into a vision transmitter. It provides negative modulation, and has the disadvantage of having wiring changes made on the transverter but these are minimal. It does have the advantage that it will work with most transverters regardless of the input frequency and also has greater resolution than the system of feeding a vision modulated carrier into the input of the transverter as it avoids video going through the earlier narrow band width stages.

My own transverter is an MM 144/432, and on the Tx side has a 2N5946 driving the aerial which is driven by a 2N5944 and in turn by a 2N6256 which is driven by a BFY90, it is to these latter two transistors we apply modulation. This is done by supplying positive modulated volts to the collector of the 2N6256 from port A of the modulator instead of the normal 12v supply and to the collector of the BFY90 from port B instead of the normal 12v supply.

Connect your transmitter to the input of the transverter in the normal way, set it for full carrier transmission i.e. FM CW. Next adjust the set bias control for about 8v at port A. Set the gain control to the middle of its range. Apply 1v of video to the input of the modulator and observe the picture on your off-air monitoring for final adjustment.

To locate the components you require to make the changes on the MM144/432 transverter looking at the top of the printed board from the front i.e. the PA Box is on your left at the back left edge of the board in a row running left to right over three 220 ohms resistors in front of the third one is a 10 ohm resistor which feeds the 2N6256. Disconnect the right-hand end and reconnect it to port A immediately to the right of it is another 10 ohms resistor that feeds power to the BFY90. Disconnect the right hand end of this also and reconnect it to port B of the modulator. It is a good idea to build the modulator on a small printed circuit board of about 1" x 3" including the vision on-off switch and mount it on 2 solder tags on the right side of the PA Box over the top of the 2N6256 there is just about enough room.

The finished modified transverter runs about 4 watts of power in the vision mode and good results have been obtained over path lengths up to about 20 miles by the author.

When the vision off switch is operated the transverter returns to normal operation which makes for easy sound idents.

PROJECT

PART 5

100

by Eric Putt and Tom Mitchell G3LMX



A PAL COLOUR PATTERN GENERATOR and SYNC PULSE GENERATOR

Some preliminary work has been done along the lines indicated at the end of part 4. However, work on the Project has had to be postponed for a number of reasons, including a four-week absence from the U.K.

This article will have to be reduced to a series of notes on some of the points which have come to light over the last few months. There is however, space for details of the Board layout and link diagrams for the Pattern Generator Board.

SPG CRYSTAL

Since the series started it has been discovered that although the 5 MHz oscillator does work in the series mode, the correction circuit Eric Putt developed requires a crystal calibrated for parallel resonance. If a series mode crystal is used the AOT capacitor has to be in the range of 280-330 pf and this swamps the amount of correction available. This does not matter if genlock and/or colour locking is not required, but in fact parallel resonant crystals are far more common and are available ex stock from a number of sources.

AVAILABILITY OF CRYSTALS

As the 17.734475 crystal for the pattern board is only available to special order, the Club has made a bulk purchase to save members money and time. We have not done the same for the 5.000 MHz unit for the SPG, because 5 MHz units are available ex stock (and surplus) from a number of sources. In fact, members may well have a suitable unit already. However, if anyone has problems in locating a crystal I will do my best to help.

PATTERN GENERATOR BOARD

Errata

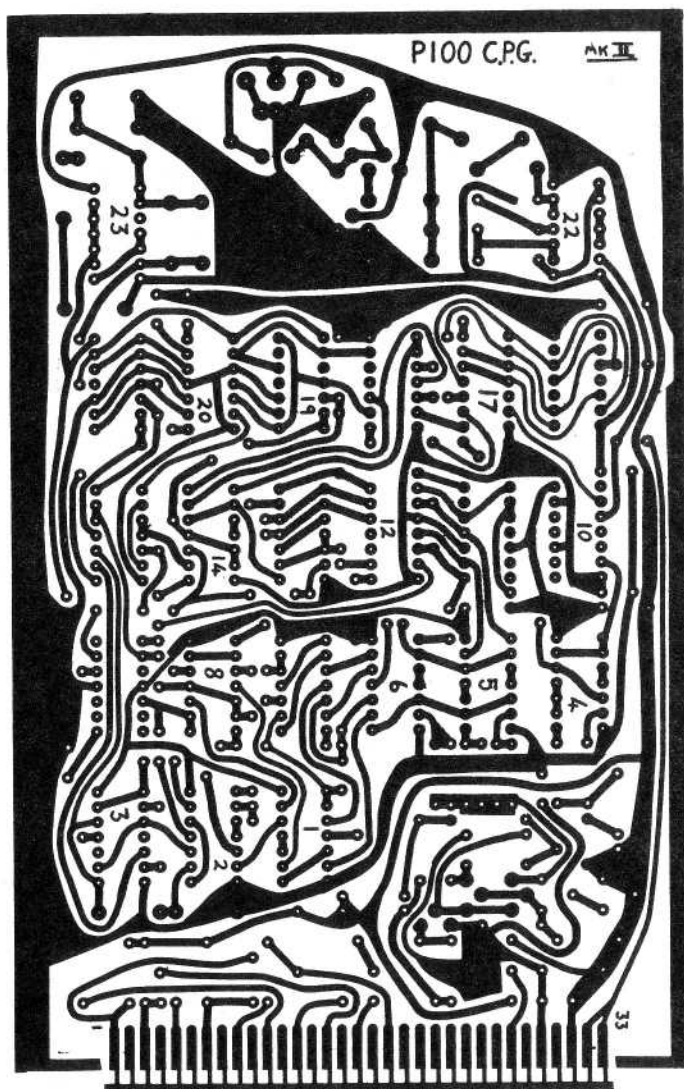
Two small points slipped through without correction last time

C Q - T V 102

Circuit Diagram Capacitor to left of IC22 is 100 pf.

Page 24 List of Semiconductors IC15 should be 7400

You may also note a few small changes between values on the circuit diagram and board layout; none of these are critical, rather the opposite, in fact!



Two points which have been noted during development may just cause problems with particular power supplies:

The board is not in general sensitive to power rail volts, but the manual 5 volt IC regulators can in fact be in the range of 4.8 - 5.2 v. Both prototypes as it happens work at as low as 4.5 volts but at the upper end of the range signs of miscounting in the ring counter have been observed.

This has been traced to some form of modulation of the amplitude out of the buffer IC22 (7400). This appears to depend on the manufacturer involved and can be cleared by decoupling the power pins (14 and 1) with a capacitor of about .001uF. It has to be admitted that 17 MHz is rather high for basic TTL.

The second half of IC9 which generates chequer board from Grille was deliberately left without a reset making the phase of the castellation random i.e. dependent on switch on timing.

While testing out an extra board with pulse buffer amps the day that this article was written, the castellations were observed to go unstable for some reason not yet determined. This can soon be overcome by extending the field drive available on pin 2 to pin 6.

TESTING THE PATTERN GENERATOR

Once the board has been wired (omitting IC23) and checked for faults, it will be observed that, with the exception of line drive which is not used, Power, 'a' and pulse outputs from the SPG are wired to the corresponding pins on the pattern generator.

The patterns are produced by earthing the four control lines (note if none are earthed output is black and burst).

Full details of the colour lock were given last time, but in brief, once the sub-carrier has been set as accurately as possible, for the simple lock feed the 4 fsc output from pin 32/33 to subcarrier input SPG pin 3 and link 'c' from SPG pin 27 back to SPG locking input pin 6. If necessary adjust the SPG until lock is observed either with a scope or on tv screen.



A SOLID STATE CAMERA

A Note by Grant Dixon G8CGK

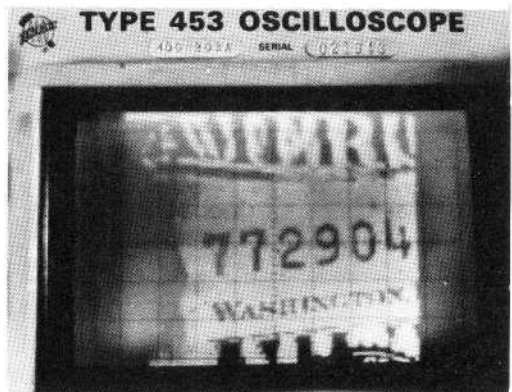
What is believed to be the first solid state camera for amateurs is now on sale in the U.S.A. It uses a Fairchild charge-coupled device - the CCD202C image sensor. This is housed in a 24 pin DIL package with an optical glass window. The actual sensitive area being 4 mm x 3 mm giving the usual 4:3 ratio. In this area is a matrix of 100 x 100 photosensitive cells which are automatically scanned when suitable clock pulses are fed to the device.

The complete camera consists of three boards. Board 1 is a digital board using 15 standard TTL packages to provide the various timing signals. Board 2 is the analogue circuits, video amplifier and clock generator; this board uses 5 ICs, 6 transistors and 7 diodes. Finally, board 3 is the power supply board which accepts a 5v dc supply and produces +6v, +15v and -4.7v. The total power needed for the whole camera is 5v at 1 amp.

As the definition is only 100 elements in each direction, the quality of the picture is reminiscent of a slow scan picture displayed through a scan converter but it must be remembered that the CCD202 produces a part scan picture. Additionally, the CCD device copes with analogue signals and there is no limitation on the number of steps of grey scale - hence no "contouring" problems.

Although the price may be somewhat forbidding to a lot of British Amateurs, there may be one or two who are sufficiently interested in the novelty of a

solid state camera to pursue the matter further - particularly when it is pointed out that the spectral response extends well into the near infra-red thus indicating a possible use for intruder detection etc.



The writer must emphasise that he has not built, nor ever seen, this camera and all enquiries should be directed to:

Solid State Sales, P.O. Box 74,
Somerville 02143, Mass. U.S.A.
who market the kit at 549 dollars + postage.

Additional details.

Supply needed 5v at 1 amp. Base also needed. 8 mm cine lens (Dmount) would be suitable. X & Y outputs can be used to feed oscilloscope - video output is then used to modulate the beam to give a picture as shown in the illustration.

Video output level - 1v.

A Versatile Solid State Vision Switch

by Jeffrey Borin

The essential element of any video switching operation is the actual switch element itself. The requirements of a good vision switch are:

- (i) Clean rapid switching action
- (ii) Wide bandwidth
- (iii) Low breakthrough in the off state

Additionally it should be simple, easily interfaced with control circuits and cheap enough to be used in large switching matrices.

The design to be described meets all of these requirements and is to be incorporated in a high quality vision mixer design which will ('hopefully!') be ready for Convention. A simple 4 input switcher with inter-field cutting was constructed as a test bed for the vision switch and this is described here. The design can be expanded as required.

The actual switching element is shown in Fig. 1. TR1 and TR3 are uncritical but TR2 must be a fast switching type as shown. In operation several of these units are connected to a common output load resistor and output buffer amplifier.

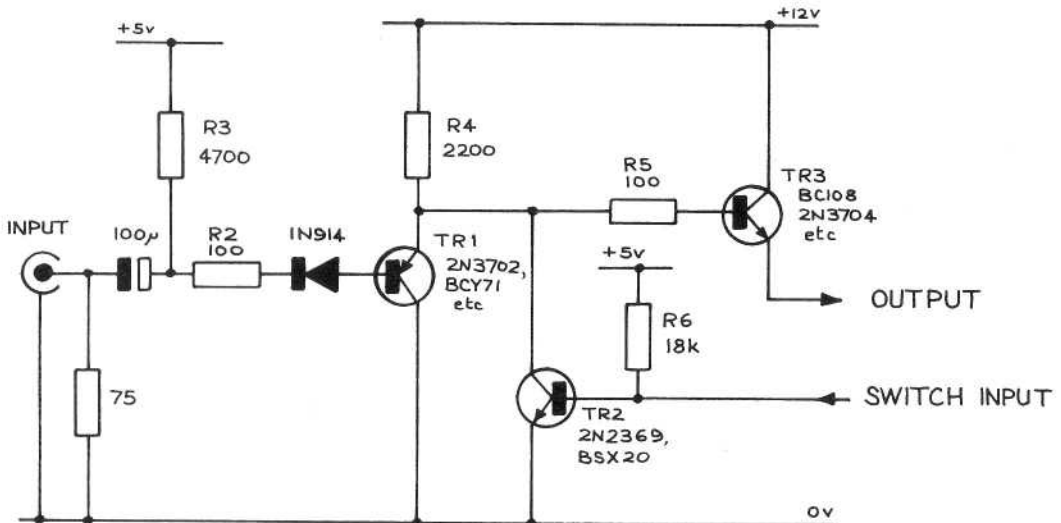


FIG 1 BASIC VISION SWITCH ELEMENT

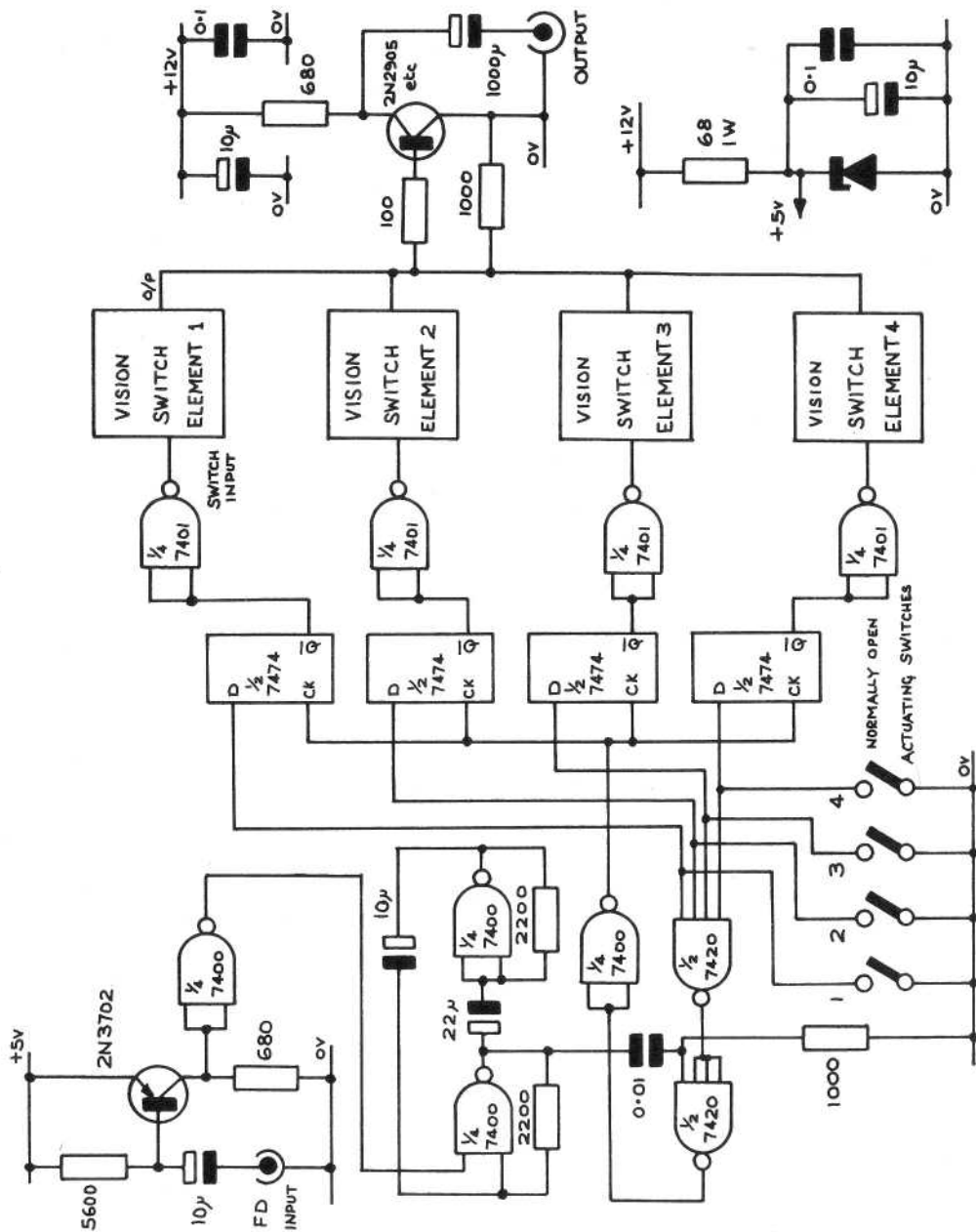


FIG2. COMPLETE 4-WAY VISION SWITCHER

It should be noted that if all switch elements are off simultaneously, even for a few hundred nanoseconds, there will be a large negative spike on the output which can be upset following circuitry. It is thus undesirable for the switch to be directly connected to mechanical push buttons and it is designed to be driven from open-collector TTL circuits. The value of R6 was chosen such that the switch turns off relatively slowly thus avoiding the negative spikes mentioned previously.

With suitable TTL drives the switch specifications are as follows:

Bandwidth:	flat to greater than 10 MHz
Diff. Gain & Phase	not readily measureable but tests indicate that these are negligible
Switching time	approximately 500ns
Off-state breakthrough	Somewhat layout dependent, certainly not worse than -54dB at 5 MHz
Switching disturbance	approximately 40mV positive going.

The circuit is thus very suitable for high quality systems especially with interfield cutting. It is not suitable for the video switch in a keying/FX generator since it is not fast enough. Although it can be improved for FX use by various modifications and adjustments the author feels that this is not worthwhile as alternative methods are available which can give very fast consistent switching times though at increased cost.

FOUR WAY SWITCHER

The unit described (Fig. 2) uses four of the switch elements in a circuit giving interfield cutting. The unit was used at the RSGB exhibition at Alexandra Palace where it worked perfectly.

An oscillator circuit runs at about 30 Hz and is synchronised by field drives if interfield cutting is required. Since the unit was only a prototype no protection was provided against selection of more than one input simultaneously. The switches are of the momentary contact type and could easily be illuminated if desired by using feeds from the corresponding flip-flops to drive 1 amp via buffers.

CONCLUSION

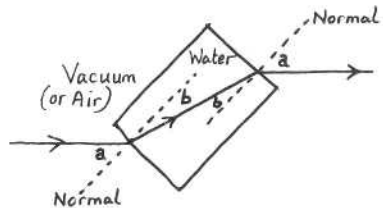
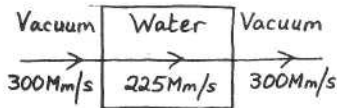
This prototype switcher has been used on several occasions and has been found very satisfactory and reliable. It is hoped to publish a design for a full scale modular vision mixer. This will be adaptable for use as anything from an assignment switcher to a comprehensive mixer for a semi-professional studio.



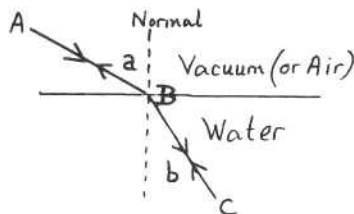
FIBRE OPTICS

by Doug Pitt

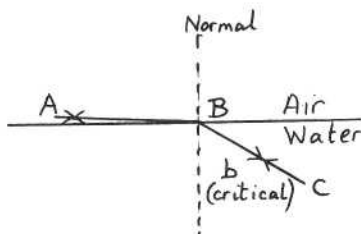
Fibre optics depends on the phenomenon of Total Internal Reflection, or TIR for short. To understand this you have to know something about refraction of light, which is the way light behaves when it passes from one "medium" (transparent substance) to another. When light passes from a vacuum to water, for example, meeting the surface head-on (normally in optical jargon) it slows down from 300 Megametres per second to $\frac{3}{4}$ of that speed. When it emerges from the other side, again normal to the surface, it instantly regains its former speed. The fact that this doesn't happen to a bullet passing through a target is the difference between Einsteinian (light) and Newtonian (bullet) physics. If the light enters the water at an angle, it changes direction, as when a car runs into thick mud on one side of it, then slews back onto course on emerging, assuming parallel sides to the water tank. The same would happen with glass, perspex etc. See figures 1 and 2.



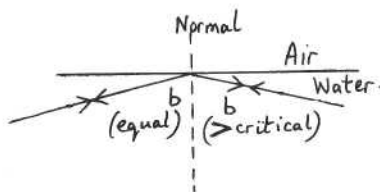
There is a simple rule to all this. When a ray of light passes from a less dense to a more dense medium, it slews towards the normal line (angle a is greater than angle b). When it passes from a more dense to a less dense medium, the reverse happens. Since light acts the same way in both directions, we don't have to draw two diagrams; we just indicate what happens with double arrows. ABC is the entry path, CBA is the exit path. There is a mathematical relationship between the angles a and b which is linked to the densities of the two media concerned. This needn't concern us here, but the greater the difference in the two densities, the greater the difference between a & b. See figure 3.



Now consider the case when a beam of light just manages to enter the water with 'a' almost a right angle, say 89.9° . Then the angle 'b' will be a critical figure, because in the reverse direction the light will just emerge, skimming the surface.



In fact, this is called the CRITICAL angle. What happens to an emerging beam if 'b' is greater than this critical angle? Obviously, it can't get out, because 'a' would have to be less than nothing. So it must either be absorbed (turned into heat energy) or reflected, or a bit of each. In practice it is almost entirely reflected, making a highly efficient mirror. Underwater swimmers who can swim deep and look upwards can confirm that a fish's view of the world is a circle of terrestrial objects above it, greatly distorted at the rim, surrounded by a reflected image of the river bottom.

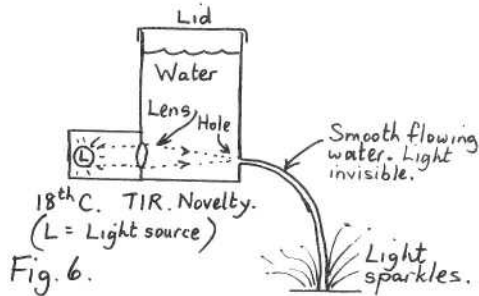


This unexpected mirror effect (TIR) is made use of in prismatic binoculars etc., because of its efficiency, but prisms of glass are heavy, and since the invention of vacuum aluminiumising of glass, it has lost its importance for mirror construction.

Now consider the case where a beam of light enters the end of a solid glass rod at greater than the critical angle. It will be reflected off the upper and lower surfaces alternately and will eventually emerge (what's left of it) from the other end. If you look down the end of a real glass rod, holding the other end facing a source of light, the effect is disappointing. Not much light gets through, unless the rod is very short; most is absorbed, especially the red ingredient, so what does emerge is strongly green in colour. These losses are caused by impurities in the glass. Plastics, like perspex, are much more efficient, and light will travel a long way down a perspex rod, negotiating quite severe curves on the way. The rule of thumb for plastic light-conduit is:- the radius of the curve to be negotiated must be more than five times the radius of the rod.

Water and other clear, pure, liquids are very efficient, as might be expected, but being liquids, are not of much practical use. However, the first well-known use of TIR was with water. In figure 6, light appears at the point where the water splashes, the whole apparatus being operated in the dark. By turning the apparatus with the water outlet upwards and employing high

pressure, a "magic" fountain results.



Rigid light conductors are of limited use; a perspex rod light guide is good enough for a doctor to examine tonsils, but for stomach, intestines, etc., something very flexible is needed. The solution to the problem of making a flexible copper conductor is very simple; divide the conductor into a bundle of very thin conductors, and it will carry the same current but will bend round corners easily without breaking. With light guides, the solution is the same one, the individual strands being referred to as fibres. For most purposes it doesn't matter if these strands touch each other, just as the thin wires in a flexible cable are usually bare and the current passes from one to the other where they happen to touch. But if the cable is carrying high frequency a.c., these contacts cause inefficiency and the individual strands of wire are enamelled so that each carries its own isolated ration of current. Where optical fibres come into molecular contact, the light can pass across from one to the other, and although this is often unimportant, except where an outer one touches the opaque, black, pvc sheath, it could be vital where each fibre is carrying a different message, in the form of modulated light. In this case cross-talk could occur and the messages could be mixed up. For this reason, optical fibres are usually encased in a thin "clad" of another clear plastic of slightly lower density, so that TIR still occurs but each fibre carries its own ration of light. The best known example of this plastic-in-plastic fibre is "Crofon" marketed in Britain by Rank-Kershaw. Individual fibres are available in $\frac{1}{2}$ mm, 1 mm, $1\frac{1}{2}$ mm dia etc., while flexible bundles of $\frac{1}{2}$ mm fibres come in 16, 32, 64 etc. strand 'cables'. See figure 7.

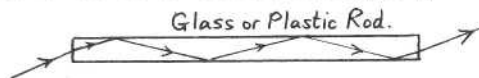


Fig 7 (a) Principle of the Light-Guide.

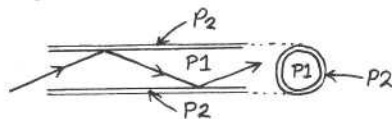


Fig 7 (b) Isolated fibre, typified by "Crofon".

It might be thought that glass with its problems of impurities would be far behind plastics. This is not the case. During the development of germanium diodes, and later transistors, it was necessary to purify this element to the unheard-of standard of one part of impurity in

10,000,000,000 parts of the element. It was accomplished by 'zone-refining' in which a moving micro-wave heated zone sweeps the impurities to one end of a long rod of the material. After many repetitions, the impurities are all at one end of the rod which is cut off and discarded. The method was later applied to the element silicon (again for semiconductor manufacture) and subsequently to glass. A measure of the progress made in this field is that ten years ago the losses due to impurities in the glass optical fibres were quoted in decibels per meter while today they are stated in dB per Kilometre. Ironically, the decline in the internal losses has made the losses at the ends relatively more important. If the ends (where the light enters or leaves) are left rough, loss is by absorption or scatter; if highly polished to avoid these factors, loss is by reflection.

All thin fibres are of course made by stretching wide ones, a technique shared with hypodermic needles and seaside rock.

A bundle of optically isolated fibres such as the Crofon type enables points of light to be re-arranged in two dimensions. Using an epoxy resin adhesive (beware of all others) the fibres can be cemented into, say, a circle at one end of the cable and, say, a straight line at the other. Such techniques are useful in mechanical tv systems, etc. If a very large number of fibres are packed closely together into a rectangular frame and polished flat, and the other end (after the fibres have been thoroughly jumbled) dealt with in the same way, the cable (usually as short as possible) becomes a coder/decoder. A negative placed on one surface with a light behind it will produce a jumbled positive print at the other. By placing the device accurately on the print the meaningless image reappears as the original picture found on the negative.

It is possible to buy (at a price) solid arrangements of glass fibres welded in perfectly parallel formation. Such devices can eliminate reflected light from CRO screens, or, if all the fibres are tapered towards one end, produce enlarged or diminished images.

A more recent development in fibres of the plastic type is one in which the usual arrangement of a higher density core surrounded by an isolating lower density 'clad' is replaced by one in which the density decreases steadily from the centre of the fibre towards the circumference. Light in such fibres travels along, not in zigzag fashion, but in a sort of sine-wave. As a result, phase shift in the light is reduced (important when using laser as opposed to ordinary incoherent light) and in addition it acts as a tiny lens, producing a little image in space at one end, of any object placed near the other end. Naturally, a single fibre is used for this trick, to avoid multiple images. This fibre is marketed by Nippon Electric under the title "Selfoc".

The immediate promise of fibre-optics is in the field of telephone and tv cables. Immune to all mains hum and high frequency electrical interference and in a sealed tube buried below ground level, immune to interference by light, each fibre can carry, on a different laser frequency or sub-carrier, thousands of telephone calls or dozens of tv programmes, without danger of any cross talk. The stumbling block is the sophisticated transmitting and receiving apparatus, not the fibre optics themselves which have already reached a high state of perfection.



The British Amateur Television Club UK SSTV Contest.

- WHEN** The 9th and 10th December 1977
- FREQUENCY BANDS** The 3.5 MHz and 144.00 MHz Bands only.
- TIMES** 19.00 to 23.00 on Saturday 9th December on both bands.
7.00 to 11.00 on Sunday 10th December on 3.5 MHz Band.
9.00 to 13.00 on Sunday 10th December on 144.00 MHz Band.
Contacts via OSCAR will also count.
- ELIGIBLE ENTRANTS** All entrants must participate in the contest from a UK location.
- SECTIONS** Section A. Stations both transmitting and receiving SSTV.
Section B. Stations only logging SSTV signals.
- CONTEST EXCHANGE** The Contest Exchange shall consist of the Callsign, Signal report (RST), Serial number, QRA Locator or QTH. (Of these the last three shall be exchanged in video only. If the location is given in sound then it must be given in a form different from that given by video eg video Didcot is in Sound 10 miles South of Oxford). Serial numbers shall commence at 001 and advance by 1 during the duration of the contest. Only one contact with each station will count for points.
- SCORING** Section A.
5 points per station contacted on the 3.5 MHz band.
10 points per station contacted on the 144.00 MHz band.
25 points per station contacted via OSCAR.
Section B.
As above for each station logged.
- CONTEST LOG** The Contest Entry Log must give the following information: Date, Time, Band, Callsign received, Report and Serial No. sent, Report and Serial No. received, QRA Locator/QTH received, Points claimed and Final Score.
- ENTRIES** All entries should be postmarked not later than the 1st January 1978 and should be sent to Mr P. A. Johnson G9EIM at 13, Birch Park, Uxbridge Rd., Hatch End, Middlesex. Entries will not be returned.
- GENERAL** Each entry should be accompanied by a brief description of the station together with details of the callsign used, the QRA locator and QTH locations as transmitted on sound and vision together with any other relevant information. Stations entering the contest may only operate from one location for contest contacts. Stations who confirm their video message contents by sound will render themselves liable to disqualification. Results of the Contest will be published in C Q - T V as soon as is practicable.
Recommended frequencies are 3.730 \pm 5Kcs and 144.23 \pm 5Kcs and via OSCAR.

errata.

The following minor errors appeared in C Q - T V No 103, and are listed here, so that members may correct their copies of the journal.

EVR Players

Fig 2 220uF and 680uF capacitors should be 220pF and 680pF respectively.

p21 para 2 "shortened" should read "shorted".

p22 para 1 "does not seem to hard" should read "does not seem too hard".

Hand Held 10 GHz Transceiver

p39 The coarse tune screw is shown correctly but it would make a lot more sense if it were mounted on the opposite side of the WG16 guide in order that the tuning may be done from the outside of the transceiver instead of being preset from the inside.

Feedback

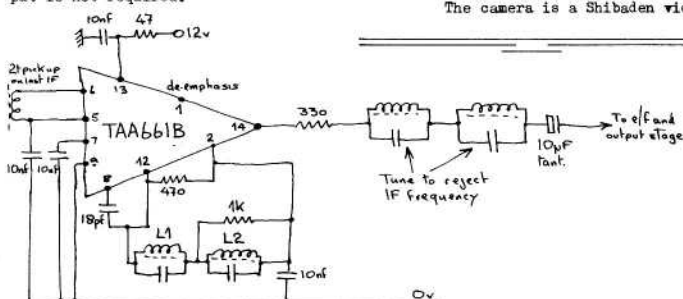
p19 two of the resistors values were omitted; TR3s base resistor is 100 K and its collector resistor 1 K. Also, all the electrolytics are back to front.

A Case for FM Vision on 23 cm to 24 GHz p19 TAA661 pin 12 should connect to junction of 15 pF and the tuned cct. Pin 2 should have a 10 nF capacitor to earth. The circuit will not work without these connections.

Further, Gary G4CRJ points out that it would work much better with the following modifications. The band-width is increased, and the output is increased. Inductive connection is more stable, the 330 ohm at pin 14 assists in keeping the device stable.

L1 tuned LF of centre frequency
L2 tuned HF of centre frequency
Pin 1 is dc high internal collector junction, feeding the e/f on pin 14.

Pin 1 de-emphasis not connected, this pin may also be used as an output avoiding the e/f output on pin 14. In this case the 10 uF tant. on the output is not required.



letters to the editor.

Dear Sir,

I must let you know about our repeater - "VK5RTV REPEATER" now comes up on screen every five minutes

The call-sign generator is the latest inclusion being added by John, VK5KG a couple of weeks ago. It is handy in a way because it gives a peak white reference signal and also lets you know you are picking up the repeated signal and not a break-through of your own. I would recommend that more people try this mode of operation especially if the repeater can be located in a suitable position. It means a lot more people can have more contacts instead of searching madly with beams to find a contact. Ours has been going for six months with the only fault being loss of mains supply, and has not ended up as the two metre repeaters have. As you will have many more viewers every time you come on one tends to spend more time on the presentation of the video whether it be just a caption, or a pan round the shack.

The general mode of operation over here is for one to go on the repeater and the other to come back to him on 53.5 MHz, or if more than one is being contacted, take it in turns on 53.5

73s for now, from
Maitland Lane VK5AO
South Australia.

Dear Sir,

Just a little note from Jersey C.I. for C Q - T V.

GJ80RH is now operational on 70 cms with 80 watts of video. Using a basic T/V Communicator (without inverter and Rx) driving a Varactor Tripler driving a QV03-20A modulated by EF184, 6CH6, E88CC, into a Linear Amp.

The Antennae at present is a MEM46, and pictures of noise free quality have been received by G8EZA and weak sync has been copied by F2LQ over 140 Kms under bad propagation.

The camera is a Shibaden vidi-

con type, with Sony monitors, etc.

And just for members who receive C Q - T V and do not operate because they think amateur tv is expensive and difficult to build, I built my Tx in three days, with modulator and PSU!!

73 de

Geoff Brown GJ80RH
St. Saviour
Jersey, C.I.

Dear Sir,

I was prompted by Peter Johnson's remarks in C Q - T V No 103 about repeaters to put pen to paper on this topic.

Although an enthusiastic atver with most of the gear to get on the air I have been so far inhibited by the lack of a proper shack --- who wants to look at pictures of bare rafters! Also the number of potential tv contacts is a bit limited, even allowing for my good site and 88-element beam. These facts haven't exactly been an incentive and I'm sure this also applies to others who may feel the investment to provide an atv station cannot be justified. But I'm nearly there... the shack's on the stocks and the transmitter is almost ready.

However per capita of amateur radio population, this Central Scotland belt must have a fairly high ratio of atvers many of whom cannot work each other for geographical reasons. It seems to me that Peter's ideas of atv repeaters combined with microwave links could provide a potential solution. ATV Repeater are not new of course as the Australian and American enthusiasts have ably demonstrated, but used in conjunction with links is an interesting twist that I haven't heard of before. I like it!

There appear to be three main pockets of tv activity in the area, Glasgow, Edinburgh and apparently, Ayrshire has a hard core of enthusiasts too. Unfortunately although atv pictures can be exchanged between Glasgow and Edinburgh, activity is spasmodic since there is a lack of incentive to transmit. It seems to me that a repeater situated on Fenwick Moor for example could receive from and transmit to Ayrshire and Renfrewshire stations, and also via a microwave link to say Blackhill where it could form one input to a 23 cm atv repeater normally accessible to stations in the Glasgow and Edinburgh areas.

Obviously this oversimplifies matters somewhat, as the link would need to be at least half duplex to allow picture exchange in both directions and what about the sound? Well perhaps intercarrier sound would be the answer or 2 metres. Not insoluble I'm sure.

One other feature which would

be worthwhile would be to have repeater outputs in the 70 cm band, so that tv sets used by many of the general public could receive the pictures without any modification. Hopefully this could provide a good publicity medium for atv. A simple Yagi pointed the same way as the domestic aerial would receive all the stations active, assuming the tuner goes low enough!

This kind of thing only becomes worthwhile if care and attention is paid to visual presentation of the material, so that the casual viewer is not subjected to wild shots of the shack as the next shot is lined up.

So it would provide an incentive not only to build atv equipment, but also to operate it with style. Look what happened when 2 metre repeaters were introduced-- they certainly provided motivation for 2 m operation for people who had never previously tried it.

I would be interested to receive any reaction from the established amateur tv operators in the region, both for and against such an idea. Also from anyone else who is interested. Sure it would cost money, but it could really open up new scope for atv in Scotland.

Yours sincerely
Morris Macdonald GM4BVU
3 Townhill Road
Earnock Estate
Hamilton
ML3 9UX

Dear Sir,

B.A.T.C. is run for its members by its Committee BUT the members rarely seem to read or hear what matters the Committee consider on their behalf, nor the actions taken, except perhaps that B.A.T.C. will have a stand at Alexandra Palace or Leicester; so often it is only after the event has taken place, within reasonable visiting/driving distance that one learns that B.A.T.C. had a stand at it.

I picked up a May copy of the BARTG NEWSLETTER at the last RSGB Exhibition and draw your attention to the "Notes from the Secretary" followed by "Committee Meeting 23 April" listing "Amongst items discussed were some 15 separate matters and the action taken by the Committee on most of them and/or the present position".

Personally I would find such information of great interest especially so far as SSTV is concerned; I can keep up to date with over-the-air information on the 10 - 80 m bands but not on 2 m beyond its normal range eg conditions have to be "good" to work G8CGK even with stacked 6 el 2 m quads at 68 ft.

Richard Thurlow G3WW
Wimlington
Cams.

Editor's Note: we would be most interested to hear the views of some other members on this subject.

Dear Sir,

As a member of B.A.T.C. I would like to publicise the local slow-scan activity on 2 m FM.

Several locals and myself run slow scan on S22, Sunday evenings at 2200 GMT. We use beams and high power and have fair coverage over a sixty mile radius from Berkshire under flat conditions. Having used slow scan on HF and 2 m SSB we have found results far superior on two metres FM, provided the deviation is kept down to the same level as fone.

Anyone in range is welcome to join in, we do try and leave breaks between overs for that reason.

P. D. Rhys G4FXB
Newbury, Berks.

Dear Sir,

I was very glad to read in C Q - T V, in Mr Brown's article, that the beginner may be catered for in the near future. It has always seemed to me that most articles have a very limited field - coloured atv or sstv is only a hope in h-l affair!

It also surprises me that with all this technical gen, nobody has produced a CQ TV SSTV Monitor complete with boards that stands a fair chance of success. After some of the gen printed,

A GUIDE TO

AMATEUR TELEVISION

Chapters on RECEIVING, TRANSMITTING, MONITORS, PICTURE SOURCES, COLOUR, RECORDING, SLOW SCAN TV together with details of Licences, history of B.A.T.C. and a list of other recommended books.

PRACTICAL HELP FROM PRACTICAL AUTHORS.

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64 Showell Lane
Penn
Wolverhampton
Staffordshire.

NOW IN ITS SECOND EDITION

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(£2.00 to non-members)

this should be dead easy. I feel that most bods start at the beginning and progress from there.

An article on the popular 5FP7 tube explaining the uses of the various grids (grid or cathode modulation etc) and the possible voltages required on these grids would be useful. A glance at the published books show very large differences.

I have a MK Products monitor made with considerable aid from the producer and have modified the demodulator from the original slope detection to the pulse counting circuit of W6MKV (73 mag) and this made a superb difference to the detail when first connected - but produced a negative picture. (MK is grid modulated, W6MKV cathode). This led to some messing about with grid volts, and now produces a good picture - but would be even better if I could turn up the gain/contrast, as this gives better grey detail, but flares out the whites. I would be pleased to have any suggestions on this problem, as I am more of a plodder than a technical bod.

However I do appreciate the work put in by all, and in no way wish to detract from the credit due to them; I just feel that it is very hard to get started without the assistance of a degree, or work at some electronics firm. I am sure many more would rally round if more gen were available.

Tom Telfer GMSJFE
Deanview
Wilton Dean
Hawick
Rox.

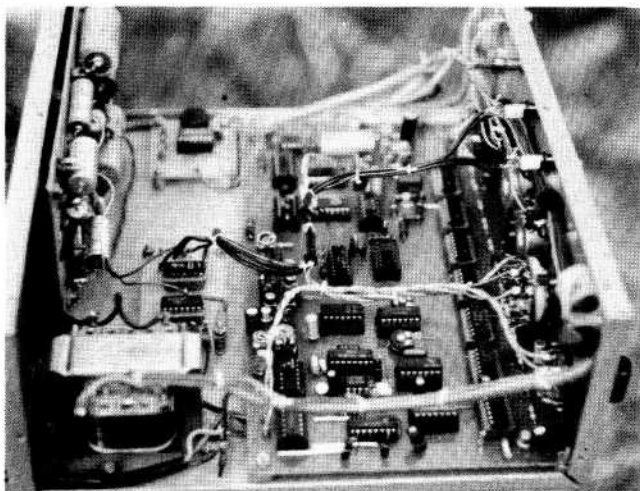
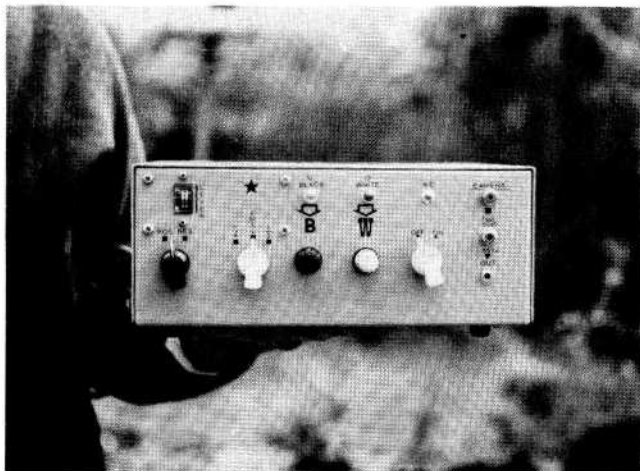
club sales

It has been decided by the committee that in future all orders for Club Sales should be accompanied by a proof of membership of BADC.

This proof is to take the form of the name and address of the member CUT FROM THE ENVELOPE CONTAINING THE MOST RECENT ISSUE OF C Q - T V.

This decision was made to ensure that only members of the Club benefit from the low prices of Club Sales. To this effect, in future the envelopes used for C Q - T V will carry the number of the issue, and carefull note will be made by the Club Sales Officer that each order is accompanied by the most recent envelope.

Please co-operate with this new scheme, which has been devised to make sure the Club's limited funds are used for the good of its members only.



two photos of a scan converter for
sstv by G3LPB

finances

On the next two pages are printed the accounts for the Club for the year ended 31st December 1977, as referred to in the report on the Convention on page 2.

THE BRITISH AMATEUR TELEVISION CLUBStatement of Accounts for the year ended 31st December 1977

<u>GENERAL ACCOUNT</u>			
	<u>Yr ended 31.12.77</u>		<u>Yr ended 31.12.76</u>
<u>INCOME</u>			
Entry Fees	38.00		-
Subscriptions: Current	1632.25		1403
Arrears	32.40		10
Donations	10.60		22
Sales of CQTV	263.32		107
Advertising Income	70.00		12
Building Society Interest	116.64	2163.21	92
			1646
Sales of SSTV Booklets	73.60		
Sales of Am Tv Books	1070.25		
	1143.85		
<u>Less Costs</u>	<u>745.48</u>	398.37	45
Surplus on SSTV Convention	20.25		21
	<u>2581.83</u>		<u>1712</u>
<u>EXPENDITURE</u>			
CQTV Printing: 4 issues	907.23		828
Postages & Envelopes	374.18		371
	1282.41		1199
General Postages & Stationery	234.63		120
RSGB Affiliation Fee	3.25		3
Meeting Expenses	0.00		58
Depreciation Office Equipment	7.00	1526.29	9
			1389
<u>SURPLUS for the year</u>	<u>1055.54</u>		<u>323</u>

<u>TRADING ACCOUNT</u>			
Sales of Equipment		898.70	521
<u>Less Cost: Stock 1.1.77</u>	<u>396.66</u>		259
Purchased	794.10		593
	1190.76		852
Stock 31.12.77	<u>379.74</u>	811.02	397
			455
<u>SURPLUS for the year</u>	<u>87.68</u>		<u>66</u>

THE BRITISH AMATEUR TELEVISION CLUBBALANCE SHEET at 31st DECEMBER, 1977

	<u>Yr ended 31.12.77</u>	<u>Yr ended 31.12.76</u>
<u>RESOURCES of the CLUB</u>		
Accumulated Fund:		
Balance at 1st January 1977	1764.31	1375
General Account Surplus	1055.54	323
Trading Account Surplus	<u>87.68</u>	<u>66</u> 389
Balance at 31st December 1977	<u>2907.52</u>	<u>1764</u>
Represented by -		
<u>FIXED ASSETS</u>		
Office Equipment at 1.1.77	34.00	
Less depreciation	<u>7.00</u>	27.00 34
<u>CURRENT ASSETS</u>		
Stocks: Trading	379.74	397
CQTV Magazines	35.13	40
Am Tv Booklets	163.75	-
SSTV Booklets	10.00	25
Stationery	<u>237.50</u>	<u>69</u>
	826.12	531
Debtors	0.00	30
Balance with Bankers	510.30	187
Balance with Giro Account	112.15	67
Balance with Building Society	<u>2402.68</u>	<u>1786</u>
	3951.25	2601
<u>Less CURRENT LIABILITIES</u>		
Creditors	427.68	537
Subscriptions paid in advance	<u>643.04</u>	<u>334</u>
	1070.72	871
NET CURRENT ASSETS	2880.53	1730
	<u>2907.53</u>	<u>1764</u>

The above Balance Sheet at 31st December 1977, together with the Trading and General Accounts for the year ended on that date, are in accordance with the books of the Club as produced to me and, to the best of my knowledge and belief, shows a true and fair view of the position of the Club at 31st December 1977 and of the results for the year.

BRIGG. 3rd May 1978

J.R. Gregory

Chartered Accountant

Adverts

ADVERTISING RATES

Back page	£15
Inside page	£12
Half page	£6
Small ads 10p per line (free to members of B.A.T.C.)	

Advertisements are inserted in C Q - T V on the understanding that advertisers comply with the law and accept responsibility for their wording. They must also undertake to reply to anyone who encloses a stamped addressed envelope with their enquiry.

B.A.T.C. Equipment Registry exists to help members of the Club who have equipment for disposal or who wish to purchase some specific item. Send a list of your "wants" and "disposals" to the address inside the front cover of this issue and during the six months for which your application is valid, the Registry will attempt to put you in touch with someone who will sell you your needs or buy your surplus. A s.a.e. would be appreciated when using this service.

B.A.T.C. possesses a Marconi Sideband Analyser which has been donated to the Club. If anyone wishes to make use of this equipment, could they contact Ian Waters at 39 Stow Road, Stow-cum-Quy, Cambridge. They will need to provide their own transport.

WANTED

SSTV Monitor, either Venus or Robot or very good home-brew.
SSTV Camera, home-brew or commercial.
CCTV Camera, cheap, with or without lens
 Phil Johnson GJ8KNV
 Mon Repos
 Fauve
 Grouville
 Jersey.

WANTED

A circuit diagram of the Weagrove type VTR 850 recorder. This machine is a 405 line type, fixed head and reel to reel. I believe they were sold as kits in the early sixties.
 Michael Gowers
 19 Albert Road
 Braintree
 Essex

WANTED

I have completed work on the W6MXV sstv monitor and all seems in order except

that the picture is only about 1" wide. I must obviously suspect the Scan Coil Assembly and would be pleased to hear of a source of one which is known to be working.

Alistair Storey G6JTI
 13 West Crescent
 MATLOCK
 Derby
 DE4 3LB

FOR SALE

Slow scan flying spot scanner(ex G3LPB) of the type that is stood in front of a monitor screen. I would want up to £20. focus coils suitable for 5FP7.
WANTED a small video monitor as the display for a VDU.
 Terry Weatherley G3WDI
 16 Beverly Court
 Carlton Colville
 Lowestoft
 Suffolk

WANTED

"Rigonda" tv and tube either working or not.
 Also circuit for above.
 Any other small portable tv considered, good price paid.
 P. J. Parker G8CKM
 10 Bridge Way
 Shawbury
 Shrewsbury.

WANTED

Any slow scan monitor and camera
 Tom Telfer
 Deanview
 Wilton Dean
 Hawick
 Rox.

FOR SALE

Lenses for Pye Mk.3 camera £5 - £8 each
 Pye Mk.3 camera, CCU, PSU, monitor, lens etc, needs working on £25
 SPG, Type WG61, transistorised 6251 with handbook & spares £20
 Pye Mk.5 camera, CCU, PSU, control pnl, lenses, spares £60
 Monitor, Pye 14" precision type £10
 Monitor, Pye Mk.3 style £5
 Mixer, Pye Mk.3 style, 3-way cut/fade valve, £5
 Rx. 405 VHF type sound & vision outputs, two for £10
 Spare parts for most Image Orthicon cameras available, please enquire.
 VDA, 1 in, 4 out, valve £3
 PDA, 1 in, 7 out, transistor £5
 4½" monitor, transistor, tube missing only £15

Colour Monitors, from £45
 Dichroic colour light splitter for colour camera, RGB & Lum, in die cast case. £50
 Please phone for details;
 B. Summers G8GQS
 Gainsborough (0427) 3940 evenings.

WANTED

Information or service manual for an EMO 26" VHF/UHF PAL colour tv. This set is of French manufacture and info. and spares are hard to come by.
 Cliff Dykes
 17 Aysgarth Court
 Sutton Common Road
 Sutton
 Surrey.

CLEARANCE

5FP7s £5 plus carriage, Scan Coils suitable for 5FP7, £1 plus carriage, 3 sets of French manufacture and info. and spares are hard to come by.
 Filters suitable for 5FP7, HiVoltage capacitors and much more.
 Will be sent from the Midlands, but first contact G3LPB at 1, Silverdale Road, Falmouth, Cornwall, TR11 4HW
 Sent only to G, GW or GM due to snags of customs etc.

FOR SALE

Philips EL8000 vidicon camera, working, with lens. From £25 - £40
 1" vidicon tubes from £8
 3BP1 crt £3
 Akai M8 stereo tape recorder 2 speed, ½ track £25
 Selection of DTL ICs offers.
 National RQ212S hand-held cassette recorder £25
 Reslo Mic CR2/H with gooseneck & switch £12
 10-turn 50 K pots with dials £1 each.
 J. West G8BCJW
 16 Penders Lane
 Falkirk
 Scotland
 Tel. 0324 26367

WANTED

Monoscope tube Type 2F21 or equivalent, for Marconi BD617B Monoscope.
 Please contact
 Mark Killingback
 2, Danby Close
 Norwich
 NR4 6EH
 Tel 0603 55264

FOR SALE

Pro fessional 17" colour monitor.
 CRT OK, with PSU & Handbook.
 First reasonable offer secures.
 Buyer collects.
 Tel; Newbury (0635) 40464

FOR SALE

Hitachi 7735A Vidicon tube, ex-industrial camera, condition unknown, but was working when last in a camera.
 £4 buyer collects.
 A. M. Hughes
 17 Woodside Ave.,
 Weston Green,
 Esher
 Surrey.



CLUB SALES

	PRICE	POST & PACKING
Camera tubes		
REV Leddicon	£82	nil
1" 9777 E.M.I. Ebitron	£28.00	nil
1" 9851 E.M.I. Amateur grade	£11.00	nil
1" P849 English Electric Amateur grade	£12.00	nil
1" 9677 E.M.I. Amateur grade	£11.00	nil
1" 9728 E.M.I. Amateur grade	£11.00	nil
4½" 9565 E.M.I. Image Orthicon	£10 for two, buyer collects	
Coils		
1" B.A.T.C. coils (limited no of ex-industrial @ £6 + 54p)	£11.50	54p
½" E.M.I. coils	£11.50	54p
Paxolin sockets for 1" or ½" vidicons	.32	8p
C mount for lens	£2.00	10p
Lapel badges	.40	8p
Adhesive badges	.15	8p
B.A.T.C. headed note paper and envelopes (50 sheets)	£1.75	
Reporting charts	.6	8p
EEV Camera chart	£ 1.65	30p
B.A.T.C. Test Card	.50	10p
Film strips of past C Q - T Vs (10 issues per strip)	£ 1.20	10p
Windscreens stickers	.6	8p
C Q - T V SPG printed circuit board ready drilled	£ 3.00	10p
C Q - T V SPG Genlock Unit printed circuit board ready drilled	£ 3.00	10p

Rapidly increasing postal charges have compelled us to quote the above post and packing charges. Will overseas members please ask for a quotation before sending cash. Obviously, for small items such as lapel badges, adhesive emblems, windscreens stickers e.t.c., one can send several items for the same price as one - please try and estimate the right amount. Our thanks go to those members who estimate on the high side and suggest that any balance can be put to Club funds.

Please send your orders to C.G.Dixon (B.A.T.C. Club Sales)

Kyrles Cross
Peterstow
Ross on Wye
Herefordshire.

PROJECT 100 printed circuit boards at £4.00 each are available from Tom Mitchel at 30 Old Farm Close, Hounslow, Middlesex. Suitable Xtals are also stocked, at £2.60. Please order these items direct from Tom Mitchel; however a small stock is held by Club Sales for the benefit of members who wish to order other items at the same time.

PUBLICATIONS

This is a separate department of the Club, do not send orders for publications to Club Sales, send orders to B.A.T.C. Publications
64 Showell Lane
Penn, Wolverhampton
West Midlands.

Slow Scan Television by B.J.Arnold G3RHI published by B.A.T.C. 2nd edition 35p + 8p p&p

A Guide to Amateur Television published by B.A.T.C. price (post paid) £1.50 to members and £2.00 to non members. Overseas postage rates on request.

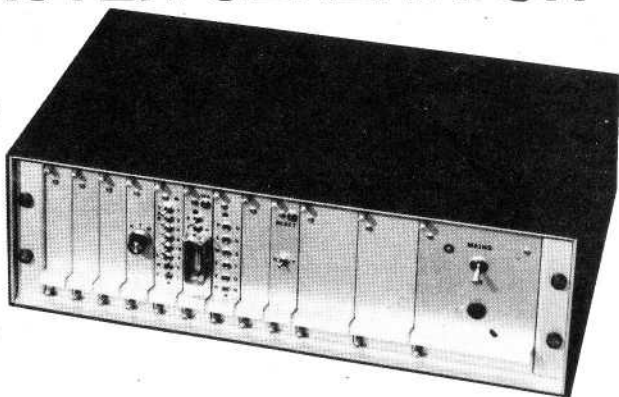
Slow Scan Television Handbook sold out

CQ-TV BACK ISSUES. The following issues are at present in stock: Nos. 68, 69, 73, 76, 77, 79, 82, 83, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, onwards. The stocks of some are very low and will soon run out. They are: Nos. 73, 76, 79, 83, and 86. Back issues cost 50p each for Nos. 93 onwards and 25p prior to 93. Return postage allowance would be appreciated. Any article which has appeared in the journal can be supplied in photo-copy form at 5p per sheet. Payment for this service should be in postage stamps. A list of all the main articles which have appeared in CQ-TV giving details of how many sheets are needed to reproduce it is available for 40p (preferably in UK postage stamps) plus a large (9" x 4") s.a.e.

PLEASE NOTE THIS LIST CANCELS ALL OTHERS.

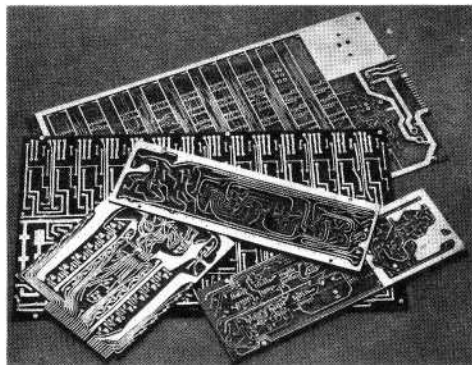
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